4.2.3 Discuss current estimates of numbers of species and past and present rates of species extinction (pg. 91-97)

→Background Extinction: The natural rate of Extinction. About 10-100/year

→Mass Extinction: LOTS of spp. die out @ one time (5 past + 1 current)

The Past: 500 million spp. throughout history (est. from fossils) ← Not all orgs. left fossils!

↳ extinction rate: 1 spp / 1,000 years SLOW

↳ 5 mass extinctions all caused by natural events (meteors, volcanos, ice age etc.)

extinction of an org. leaves an open niche & new spp. evolve to fill it. (Fig. 5.4 in text)

Current: 10-80 million spp. currently BUT only 1.8 million named & described

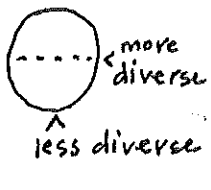
↳ extinction rate: 40-100 spp/day (estimate - some spp. die out bf. they are ID'ed)

↳ Currently in the 6 mass extinction (caused by humans) biggest impact on larger organisms. ↳ See Extinction Notes!

4.1.1 Define the terms biodiversity, genetic diversity, species diversity, and habitat diversity (pg. 99-100)

2.3.4 Define the term diversity

→diversity: The # of different spp. & the #'s of individuals of each spp.



→biodiversity: "Totality of genes, spp., & ecosystems of a region" it includes: genetic diversity, species diversity, & habitat diversity

* More diverse = more stable!

→genetic diversity: The range of genetic material in a population (gene pool)

Small populations tend to have ↑ genetic diversity.

→species diversity: How many species & How many of each in an area.

* The spread of individuals of diff. spp. is more important than the total # of spp. in a habitat. → for example: 100 Potatos Not as stable as 20 Potatos, 5 carrots, & 10 tomatos

coral reefs & trop. rainforests very spp. diverse!

→habitat diversity:

# of different habitats in an area.

Coral reefs & tropical rainforests very habitat diverse!

4.1.4 Explain how plate activity has influences evolution and biodiversity (pg. 102-105)

- When plates are adjacent orgs. can migrate across (similar fossils across continents) - when plates sep. those orgs. go through Allopatric Speciation & evolve & adapt to their new environment.

- Plate Boundaries → uplift [↗↖] leads to mountains → Allopatric Speciation

→ Transform Boundaries [↓↑] can lead to breaks in land after an earthquake → Allopatric Speciation

4.1.2 Outline the mechanism of natural selection as a possible driving force for speciation (pg. 100-102)

the formation of 2 new spp.

Natural Selection

org. that are more adapted to an envirn will survive better & have more babies - Be more "fit"

↳ After many generations the original & new pops. cant interbreed = 2 spp.

Sympatric Speciation

"Reproductive Isolation"

No physical boundaries

due to:
- Behavioural (nocturnal, mating rituals etc)
- Structural (shape of sex organs)
- Game mortality (sperm &/or eggs die in unfamilian territory)
- Hybrid sterility - Hybrids (offspring of 2 spp.) cant have offspring

Allopatric Speciation

- Physical Barriers split the gene pool bc. orgs. on both sides of boundary cant mix. → evolve differently

ex. mammals & marsupials coexisted by once the continents split Marsupials out competed Mammals in Australia.

ex. cichlid fish in various lakes in Africa - all related but different species.

- Land Bridges used to connect land masses so orgs. could move But now they are covered w/ water → pops are isolated for example. Camels

4.1.3 State that isolation can lead to different species being produced that are unable to interbreed to yield fertile offspring

See above for discussion of Allopatric Speciation

4.2.1 Identify factors that lead to loss of diversity → Natural Causes
Climate Changes, volcanos, asteroids,

↓

Human Caused

"HIPPO" ←

- Habitat degradation or destruction
  As pop. of humans grow our need for space increases → cut down forests, rainforests etc. Start growing in the desert, use water for irrigation
  - HABITAT fragmentation - dividing up land into smaller chunks. Orgs. can't migrate, edge effects occur (diff light, sounds etc.) bc. they are on the edge.

2 more

- Modern Agriculture Methods
  ↓
  Monocultures gmo → loss biodiversity

- Invasive Species - AKA Non-native spp.
  Humans move orgs. purposfully or by accident. New species outcompete native species. for example Cane Toads in Australia

- Population - As human pop. ↑ we use up more & more resources (water, land, space, forests, etc. etc.) We phase orgs. out of the space & resources.

- Disease - can impact all the pop. of one spp. & kill the whole species. As climate change occurs Warmer temps = More new & reemerging diseases.

- Pollution degrades habitat
  ↳ Local - pesticides etc. into waterways
  ↳ Factories
  ↳ Air
  ⇓
  Climate Change - orgs. may have to change their ranges & have to compete w/ new orgs

- Over Exploitation - technology allows us to catch, hunt, grow more efficiently.
  ↙ ex. ↓ We use up so much orgs. can't replace themselves.
  Timber fishing

4.2.4 Describe and explain the factors that may make species more or less prone to extinction

* Numbers - if there are a lots of that species than there is ↓ Extinction. bc. you would have to have higher numbers be affected.

* ↑ Specialized ↑ Extinction. Specialized organisms rely on very specific habitat, prey etc. and are more affected if one of those things changes. Generalists can just make adjustments.

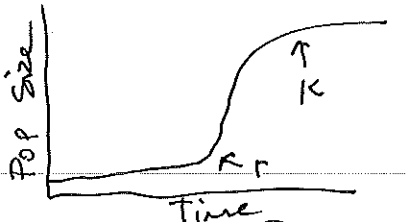
* Distribution - Orgs. that are only found in one place (they are endemic) they can easily be wiped out if something happens to that place. Orgs. that are ↑ distribution won't be affected if something happens in only one part of their range.

* Behavior - if you can migrate than you can often get away from cause of extinction. BUT seasonal migrants need both habitats to be in good shape & their migration can be long & difficult.

* Trophic Level - The higher you are the ↑ extinction risk you rely on more orgs. below you - if something happens to them you will have a problem.

* r or K Selected?

r organisms ↓ Extinction Bc. there are ↑ #s, ↓ food chain, ↑ babies, & small



K organisms ↑ Extinction Bc. ↓ #s, ↑ food chain, ↓ babies, & Big

often hunted for food or sport
ex. Elephants for ivory
Whales for oil

r ➪ Remember Roaches

K ➪ Remember King Kong